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ANGLE-ONLY DATA ACQUISITION FROM OPTICAL OBSERVATION CAMPAIGN TO SET AN  
EFFECTIVE TRACKING STRATEGY OF GEO OBJECT, COMS 1 OF KOREA**Abstract**

Astrometric measurement by the optical equipment can be used for acquiring precise angle position of space objects on high altitude like geostationary Earth orbit (GEO) satellites. An observation campaign to define an effective tracking strategy for geostationary Earth orbit satellites is done in 11 nights from 15th of January 2014 to 10th of February 2014. A primary target object is COMS 1, Korean domestic GEO satellite which has a station keeping box, size of 0.1 by 0.1 degree of arc at east longitude of 128.2 degrees. We use a 60 cm class optical telescope in Korea astronomy and space science institute (KASI) and a 2k CCD camera with a field of view, 1 by 1 degree. To determine the precise satellite position, we should have accurate time and position information on the observed images. To insure the precision of the time, the internal clock of the telescope and CCD camera control system is synchronized with the GPS signal for every 1 minute. The exposure time is set to 0.2 second to acquire a correct GEO satellite image as a point source. Two softwares, the World Coordinate System tools and the Source Extractor are used to correct the positions of background stars and determine the position of every object in optical images with the star catalogue. To compare the accuracy of positions, we use the propagated position using Two Line Elements (TLE) data from JSpOC and System ToolKit (STK). The precision of the acquired epoch time information is analyzed with the measurement of CCD shutter response time. The accuracy of the measured position information is verified with the error of star catalogue and the seeing with an accuracy of software using for defining the center of point source. We tried to reduce the error of angle only measurement for orbit determination without a priori. Based on this result, an optimized observation strategy is suggested for tracking the object on GEO sustainedly.